

## REMARKS

Claims 1-18 were presented for examination. Reconsideration is respectfully requested.

Claims 1-18 are rejected under 35 USC 101 for double patenting over various claims of US Patent 6,598,459. This rejection is respectfully traversed.

As was stated in the prior response, the Patent Office erred in issuing US Patent 6,598,459 with Claims 1-16. These are not the allowed claims. This is readily verified by checking the Patent Office file of the case.

After receipt of a notice of allowance, and payment of the issue fee, Applicant was notified that the Patent Office had lost the file. Applicant submitted all correspondence to reconstruct the file. However, in issuing the patent the Patent Office included the claims as amended after the first office action, which were not allowed, instead of the 29 claims from a later response that were allowed. A copy of the notice of allowance, showing 29 instead of 16 allowed claims is attached. Again, this is readily verified by checking the Patent Office file of the case.

**Applicant has previously requested that the Patent Office correct the claims of the issued patent.** As explained therein, because of the need for the Patent Office to renumber the claims before issuance, Applicant did not consider a certificate of correction appropriate. A re-exam is not appropriate since the allowed claims are not in dispute and no new prior art issues have arisen. Therefore Applicant asked the Patent Office to correct the claims. A copy of this request, filed at the time of the prior response, is attached. **Unfortunately, following the history in the case, the request appears to**

**have been lost.** No response of any kind has been received from the Patent Office and PAIR does not list the request. Therefore Applicant will resubmit the request.

The allowed claims were limited to aerogel material, a different material from the materials being claimed in the present case. The present application was filed to cover the other materials which were not considered in the parent case. Accordingly no double patenting exists since the subject matter of the present claims is not included in the allowed claims of the parent case.

The Examiner is failing to consider the substance of the case, merely on the basis that the claims have not yet been corrected. This ignores the fact that the issued claims are not the true claims, as is readily verified from the Patent Office's own files. Therefore

**Claims 1-16 cannot form the legal basis for any rejection.**

A power of attorney is submitted herewith.

Accordingly it is submitted that all claims now present in the case are in condition for allowance, which is earnestly solicited. If any impediment should remain which can be resolved by telephone, please contact Applicant's Attorney at (925) 455-9586.

Respectfully submitted,



Henry P. Sartorio  
Reg. No. 28,535

Date: 01/31/2005

**PART B—ISSUE FEE TRANSMITTAL**

Complete and mail this form, together with applicable fees, to: **Box ISSUE FEE**  
**Assistant Commissioner for Patents**  
**Washington, D.C. 20231**

**MAILING INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee receipt, the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

MMC1/0530

CHI YUNG FU  
 1005 DUNCAN STREET  
 SAN FRANCISCO CA 94131

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

**Certificate of Mailing**

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

CHI YUNG FU  
 01/29/01  
 8/29/01  
 (Depositor's name)  
 (Signature)  
 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/223.831	01/02/99	3025	CYGAN, M	2856 05/30/01

First Named Applicant FU, 35 USC 154(b) term ext. = 0 Days.

ITLE OF VENTION ARTIFICIAL OLFACTORY SYSTEM

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEES DUE	DATE DUE
3	073-023.340	G94	UTILITY	YES	\$620.00	08/30/01

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

"Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 \_\_\_\_\_  
 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)  
**PLEASE NOTE:** Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY & STATE OR COUNTRY)

Please check the appropriate assignee category indicated below (will not be printed on the patent)

Individual  Corporation or other private group entity  Government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

Issue Fee  
 Advance Order - # of Copies 1000

4b. The following fees or deficiency in these fees should be charged to:

DEPOSIT ACCOUNT NUMBER \_\_\_\_\_  
 (ENCLOSE AN EXTRA COPY OF THIS FORM)

Issue Fee  
 Advance Order - # of Copies \_\_\_\_\_

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature)

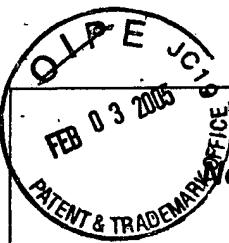
(Date)

8/29/01

NOTE: The Issue Fee will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

**Burden Hour Statement:** This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	09/223,831	FU, CHI YUNG	
	Examiner Michael Cygan	Art Unit 2856	

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address—

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to the amendment of 18 May 2001.
  2.  The allowed claim(s) is/are 1.3-12 and 14-31.
  3.  The drawings filed on \_\_\_\_\_ are acceptable as formal drawings.
  4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a)  All
    - b)  Some\* c)  None of the:
      1.  Certified copies of the priority documents have been received.
      2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5.  Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION. This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).**

6.  Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7.  Applicant MUST submit NEW FORMAL DRAWINGS
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review( PTO-948) attached
    - 1)  hereto or 2)  to Paper No. 2.
  - (b)  including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the examiner.
  - (c)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8.  Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE / SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

#### Attachment(s)

- |   |  |
|---|--|
| <input type="checkbox"/> Notice of References Cited (PTO-892)<br><input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)<br><input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____.<br><input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)<br><input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____.<br><input type="checkbox"/> Examiner's Amendment/Comment<br><input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance<br><input type="checkbox"/> Other |
|---|--|



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Chi Yung Fu

Pat. No.: 6,598,459

Date: July 29, 2003

For: Artificial Olfactory System

REQUEST FOR CORRECTION OF PATENT

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

The Patent Office is requested to correct the claims of the above-identified patent as follows. Claims 1-16 as issued should be deleted and replaced by the 29 claims numbered as Claims 1, 3-12, 14-31 in the amendment filed after the advisory action.

Subject patent issued on application Ser. No. 09/223,831 filed Jan. 2, 1999.

After receipt of the notice of allowance and payment of the issue fee, Applicant was notified that the Patent Office had lost the file, and that the file would have to be reconstructed. Applicant submitted all correspondence between Applicant and the Office. These included an amendment submitted in response to the first (nonfinal) office action, a response (without amendment) filed in response to the final office action, and a second amendment filed after the notice of appeal and an interview with the Examiner on May 14, 2001. The second amendment contained 29 claims, numbered as Claims 1, 3-12, 14-31, and placed the case in condition for allowance as shown by the notice of allowance, which indicates 29 total claims allowed.

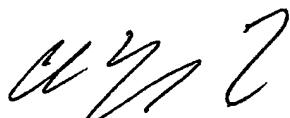
However, when the Patent Office issued the patent, the Office included the 16 claims from the first amendment, which were not allowed, and not the 29 claims from the last amendment, which were the allowed claims.

Accordingly the Inventor requests that the office correct the patent to include the allowed claims. A copy of the claims as filed in the second amendment is attached hereto.

Since the claims need to be renumbered (the claims are not numbered consecutively because of cancelled claims and some claims depend on later numbered claims), the Inventor is unable to file a Certificate of Correction. Applicant does not know how the Office would renumber the claims.

If any issues can be resolved by telephone, please contact the Inventor at (415)370-4355 .

Respectfully submitted,

  
Chi Yung Fu

The following Claims 1, 3-12, 14-31 were presented in the last amendment filed and resulted in allowance of the case. These claims, properly renumbered, are the correct claims for the issued patent.

1. (twice amended) A sensor element for an artificial olfactory system, comprising: a sensor substrate; a layer of surface modifiable material on a surface of the substrate; wherein the surface of the surface modifiable material is modified to enhance sensitivity to a plurality of different odorants and the surface modifiable material is aerogel.
3. (amended) The sensor element of claim 20 wherein the odorant molecule attachment material is a polymer.
4. (amended) The sensor element of claim 20 wherein the odorant molecule attachment material is radiation treated to enhance its adsorption or absorption characteristics.
5. The sensor element of claim 1 wherein the sensor substrate is a resonator.
6. The sensor element of claim 1 wherein the sensor substrate is a piezoelectric crystal, a surface acoustic wave (SAW) device, or a micro-machined resonator.
7. (amended) The sensor element of claim 20 wherein the odorant molecule attachment material is designed for virus attachment.
8. (amended) The sensor element of claim 20 wherein the odorant molecule attachment material is an antibody, a protein, or a cell membrane.
9. (amended) The sensor element of claim 1 further comprising a reactive material operatively associated with the sensor substrate for reacting with a substance to be detected which is not itself a detectable odorant molecule to produce detectable odorant molecules.

10. (twice amended) An artificial olfactory system, comprising: a plurality of sensor elements, each sensor element comprising a sensor substrate; a layer of surface modifiable material on a surface of the substrate; wherein the surface of the surface modifiable material is modified to enhance sensitivity to a plurality of different odorants and the surface modifiable material is aerogel; a measurement device connected to the plurality of sensor elements to detect changes produced by the presence of odorant molecules; a signal processor connected to the measurement device.
11. (amended) The artificial olfactory system of claim 10 wherein the measurement device is a frequency or phase detector which detects changes in the resonant frequency or phase of each sensor element.
12. (amended) The artificial olfactory system of claim 10 wherein the signal processor is an artificial neural network modified by using human knowledge or higher level description to enforce additional constraints to facilitate odorant identification.
14. (amended) The artificial olfactory system of claim 23 wherein the odorant molecule attachment material is a polymer.
15. (amended) The artificial olfactory system of claim 23 wherein the odorant molecule attachment material is radiation treated to enhance its adsorption or absorption characteristics.
16. (amended) The artificial olfactory system of claim 23 wherein the odorant molecule attachment material is designed for virus attachment.
17. (amended) The artificial olfactory system of claim 23 wherein the odorant molecule attachment material is an antibody, a protein, or a cell membrane.
18. (amended) The artificial olfactory system of claim 10 further comprising a reactive material operatively associated with the sensor substrate for reacting with a substance to

be detected which is not itself a detectable odorant molecule to produce detectable odorant molecules.

19. The sensor element of claim 1 wherein the surface of the surface modifiable material is modified by physical or chemical means.

20. The sensor element of claim 19 wherein the surface of the surface modifiable material is modified by attachment of an odorant molecule attachment material.

21. The sensor element of claim 1 wherein the surface of the surface modifiable material is modified by specific functionalization for recognition purposes.

22. The artificial olfactory system of claim 10 wherein the surface of the surface modifiable material is modified by physical or chemical means.

23. The artificial olfactory system of claim 22 wherein the surface of the surface modifiable material is modified by attachment of an odorant molecule attachment material.

24. The artificial olfactory system of claim 10 wherein the surface of the surface modifiable material is modified by specific functionalization for recognition purposes.

25. The sensor element of claim 1 wherein the surface modifiable material is an aerogel having a density between  $0.003 \text{ g/m}^3$  and  $0.7 \text{ g/m}^3$ , and a specific surface area between  $50 \text{ m}^2/\text{g}$  and  $1160 \text{ m}^2/\text{g}$ .

26. The artificial olfactory system of claim 10 wherein the signal processor includes a noise filter which performs forward and reverse Fast Fourier Transform (FFT) of signals from the measurement device, and an auto-associative neural network for further filtering.

27. The artificial olfactory system of claim 10 wherein each of the plurality of sensor elements responds differently to the same species, and each sensor element responds differently to different species.
28. The artificial olfactory system of claim 27 wherein the signal processor identifies a species being detected by pattern recognition from the outputs of the plurality of sensor elements.
29. The artificial olfactory system of claim 28 wherein the signal processor is an artificial neural network which has been trained with a number of different odorant signatures and can generalize beyond those learned patterns to identify odorants.
30. The artificial olfactory system of claim 10 wherein the signal processor is a processor which performs data fusion from a plurality of channels, takes into account signal drift, extracts signals from noisy environments, recognizes patterns of signals from the plurality of sensor elements, and generalizes from learned patterns.
31. The surface modifiable material of claim 1 wherein the aerogel is a xerogel.